

Abstract

Methods of treating an individual who has a disease or disorder associated with one or more genetic mutations or undesirable alleles in genomic DNA of the individual, or preventing an individual from developing a disease or disorder associated with one or 5 more genetic mutations or undesirable alleles in genomic DNA of the individual, by replacing a segment of genomic DNA that has a mutated sequence or undesirable allele with a corresponding segment of DNA that has a non-mutated sequence or desirable allele, are disclosed. Methods of inducing tolerance and preventing transplant rejection in a recipient, methods of inducing tolerance and or reducing allergies are disclosed and 10 method of increasing fertility in a woman are disclosed. Each of the methods comprises replacing a segment of genomic DNA in an individual with a corresponding segment of DNA from another. An apparatus for doing large scale PCR preparations is disclosed. Pharmaceutical compositions that comprise a plurality of polynucleotide molecules which collectively comprise an essentially complete genome in polynucleotide molecules having 15 about 100-3000 nucleotides are disclosed.